# NAVAL HEALTH RESEARCH CENTER

# *HOSPITAL ADMISSION RATES AND LENGTHS OF TREATMENT AMONG A CONUS-BASED COHORT OF NAVY PERSONNEL*

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*Report No. 01-21*

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# Hospital Admission Rates and Lengths of Treatment Among a CONUS-based Cohort of Navy Personnel

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Technical Report No. 01-21, supported by the Defense Advanced Research Projects Agency (DARPA), Arlington, VA under Work Unit No. 60103. The views expressed in this report are those of the authors and do not represent an official policy or position of the U.S. Navy, the Department of Defense, or the U.S. Government. Approved for public release; distribution unlimited.

## Introduction

With the advent of advanced, 'smart' technologies, smaller-sized complements of personnel will be responsible for accomplishing the same tasks that much larger forces handled in the past. As a consequence, smaller numbers of personnel who become medically ineffective have the potential for a much greater impact on the accomplishment of operational missions. Thus, it is critical to determine threshold levels of disease and injury rates so that the appropriate degrees of training and cross-training with various advanced technologies may be determined.

## Objective

The objective of this effort was to determine the number of individuals who may be unavailable on the eve of a hypothetical deployment due to disease and nonbattle injury (DNBI) hospital admissions.

## Methods

A cohort of Navy personnel enlisting after the Gulf War (April 1991- December 1992) was defined using service history files maintained by the Naval Health Research Center in San Diego, CA. The length of each service member's time in the Navy was then determined from the service history files. Records of hospital admissions for this cohort were then extracted from medical history files maintained at the Naval Health Research Center. Rates of DNBI incidence and mean lengths of treatment were computed for the overall cohort, and for men and women service members separately.

## Results

The overall rate of hospitalization for the Navy cohort examined was 0.304 admissions per 1000 strength per day. The mean length of treatment was 5.32 days. Multiplying the admission rate times the mean length of treatment yields a 'medically ineffective' rate of 1.62 individuals per 1000 strength per day. A substantial gender difference in hospitalization incidence did exist, due largely to female admissions for pregnancy-related conditions.

## Conclusions

Determination of the levels of training and cross-training of personnel on advanced technologies critical to mission success should take into consideration that two people per 1000 strength may be medically ineffective on any given day.

# Hospital Admission Rates and Lengths of Treatment Among a CONUS-based Cohort of Navy Personnel

## *Introduction*

With the advent of advanced, 'smart' technologies, smaller-sized complements of personnel will be responsible for accomplishing the same tasks that much larger forces handled in the past. As a consequence, smaller numbers of personnel who become medically ineffective have the potential for a much greater impact on the accomplishment of operational missions. It is thus critical to determine threshold levels of disease rates so that the appropriate levels of training and cross-training with various technologies may be determined. By determining the number of individuals who may be unavailable on the eve of a hypothetical deployment due to disease and nonbattle injury (DNBI) hospital admissions, planners may more accurately determine the overall number of personnel needed to ensure operational success.

The Defense Advanced Research Projects Agency (DARPA) requested that the Naval Health Research Center conduct a small-scale study to determine the likely level of medical ineffectiveness on the eve of a potential operational deployment. Because of the controversy surrounding the health of some veterans returning from combat service, the decision was taken to limit the study population to those Navy personnel who enlisted after the Southwest Asia combat deployment. Further, because the Navy has discontinued the formal recording of inpatient admissions aboard ships, the study was limited to those personnel attached to U.S. shore stations and those assigned to vessels that did not make prolonged deployments.

## *Method*

All Navy personnel enlisting in the service for the first time between April 1991 and December 1992 were included within the study cohort. The time period examined was from the point of service entry until December 31, 1997, unless the service member exited the service before this cut-off date. This cut-off date was chosen because there is often a lag between a hospitalization and the time that that specific admission is entered into the inpatient data files; selection of this particular date ensured that all hospitalizations occurring up through 1998 would have been entered at the time the extract was created.

The total person-days for each service member were computed as the time period from service entry until one of three criteria were met: 1) exit from service if before 12/31/1997, 2) the cut-off date was achieved, or 3) the service member was assigned to a non-CONUS shore facility or to a ship that makes other than brief deployments. This third criteria was necessary because personnel subject to sustained sea duty cannot be tracked medically during these deployments since inpatient records are no longer maintained for personnel on deployed ships; similarly, while personnel treated at Naval overseas medical facilities have those hospital admissions recorded, any admissions while en route would not be recorded. Total person-days were summed across the entire cohort to determine overall 'days at risk.'

After the days-at-risk were computed, hospital admissions during each individual's period-at-risk were tabulated. Admissions were tabulated by International Classification of Disease (ICD) categories: Infectious & Parasitic Disorders; Neoplasms; Endocrine, Nutritional, & Metabolic Diseases and Immunity Disorders; Diseases of the Blood and Blood-forming Organs; Mental Disorders; Nervous System and Sense Organ Disorders; Circulatory Disorders; Respiratory Disorders; Digestive Disorders; Genitourinary Disorders; Pregnancy-related Conditions; Skin & Subcutaneous Tissue Disorders; Musculoskeletal System and Connective Tissue disorders; Congenital Anomalies; Symptoms, Signs, and Ill-Defined Conditions; Injuries and Poisonings; and Supplemental Conditions. Hospital admission rates were computed by dividing the total hospital admissions, and individual ICD category totals, into the overall days at risk. To avoid exceedingly small numbers, rates were computed per 1000 strength per day. Hospital admission rates were also computed for male and female personnel separately.

Mean length of hospital stay was determined by computing the days between admission and discharge for each hospitalization and then averaging across all hospitalizations. Lastly, a 'medically ineffective' rate was computed for the overall population, and males and females separately, by multiplying the hospitalization rates by the mean lengths of stay.

## *Results*

There were 55,789 Navy personnel who enlisted in the time period of this study; these personnel represented 25,074,789 person-days. Within this cohort, there were 47,674 males and 8,115 females; these sub-populations comprised 19,912,862 and 5,161,927 person-days respectively. The mean age within the cohort was 20.69 years.

Table 1 is a display of the numbers and rates of hospitalizations within each ICD category for the total cohort. The overall rate of hospitalization incidence was 0.304 per 1000 strength per day. The most prevalent categories of hospitalization were Pregnancy-related conditions, Mental disorders, and Musculoskeletal System problems. Table 2 is a presentation of the disease category percentage and rates for male and female personnel separately. Mental disorders comprised the largest percentage of the male hospital admissions (28.3%) while pregnancy-related conditions constituted the largest category percentage for females (42.4%). The overall hospitalization rate for males was 0.219, while the rate for females was 0.632.

Often, individuals have more than a single diagnosis for any given hospitalization. Table 3 juxtaposes the category percentages for primary diagnoses with the percentages for secondary diagnoses. As can be seen from Table 3, the Supplementary Conditions category comprised one-fifth of the secondary diagnoses. The most prevalent diagnoses within this category were: V27 (Outcome of delivery; 51% of Supplementary diagnoses) and V57 (Care involving use of rehabilitation procedures; 13% of Supplementary diagnoses)

Table 4 is a display of the 15 most prevalent diagnoses for hospital admissions among the entire cohort, while Tables 5 and 6 separately present the most prevalent diagnoses for males and females. Among males, adjustment reactions, alcohol dependence syndrome, and personality disorders were the most prevalent reasons for hospitalization. Among females, pregnancy-related conditions and adjustment reactions were the most frequent diagnoses underlying hospital admissions.

Table 7 is a presentation of the average length of hospital stay by ICD category of admission. The average length of stay across disease categories was 5.32 days. The longest mean length of stay was for the mental disorders category (13.9 days) while the shortest average stay was for the category of musculoskeletal disorders (1.96 days). Table 8 is a display of the cohort's category illness rates, mean lengths of stay, and 'medically ineffective' rates derived by multiplying the illness rates times the average lengths of hospital stay. As can be seen from Table 8, the data indicated that 1.62 person-days per 1000 were lost to hospitalization. Tables 9 and 10 present the 'medically ineffective' rates for males and females separately.

## *Summary*

Any determinations as to the appropriate levels of training and cross-training needed to ensure that sufficient personnel are available to operate 'smart' technologies must factor in the numbers of personnel that may be medically unavailable at any point in time. An examination of hospitalization incidence among a cohort of Navy personnel enlisting in the year following the Gulf War indicated an overall hospitalization rate of 0.304 per 1000 strength per day and an average length of hospitalization of 5.32 days. Combined, these two statistics indicate that 1.62 of every 1000 person-days are lost to hospitalization. The medical ineffective rate for males was 1.42 per 1000 person-days while the rate for females was 2.40.

Because this study examined a cohort of recent enlistees to avoid any potential confounding with Gulf War service, the mean age of the cohort (20.7 yrs) is younger than the general Navy population. While this study was designed to be small in scope because of budgetary considerations, it nevertheless provides a general idea of the numbers of Naval personnel that may be unavailable at any given time for medical reasons. Should a more comprehensive examination of medical ineffectiveness by occupation and/or across a wider sampling of the Navy population be desirable, the Naval Health Research Center stands ready to assist in such an endeavor.

**Table 1. Distribution and Rates of Hospitalization by International Classification of Disease Category for U.S. Navy Cohort**

| International Classification of Disease (ICD) Category | Number of Hospitalizations | Percent of Hospitalizations | Hospital Rate per 1000 strength per day |
|---|---|---|---|
| | | | |
| Infectious/Parasitic | 355 | 4.7% | 0.0142 |
| Neoplasm | 138 | 1.8% | 0.0055 |
| Endocrine | 70 | 0.9% | 0.0028 |
| Diseases of the Blood | 40 | 0.5% | 0.0016 |
| Mental Disorders | 1630 | 21.4% | 0.0650 |
| Nervous System | 173 | 2.3% | 0.0069 |
| Circulatory | 73 | 1.0% | 0.0029 |
| Respiratory | 505 | 6.6% | 0.0201 |
| Digestive | 651 | 8.5% | 0.0260 |
| Genitourinary | 406 | 5.3% | 0.0162 |
| Preg., Childbirth, Puerperium | 1383 | 18.1% | 0.0552 |
| Skin/Subcutaneous | 252 | 3.3% | 0.0100 |
| Musculoskeletal | 727 | 9.5% | 0.0290 |
| Congenital | 64 | 0.8% | 0.0026 |
| Symptoms/ill-defined conditions | 276 | 3.6% | 0.0110 |
| Injury, poisoning | 683 | 9.0% | 0.0272 |
| Supplementary | 202 | 2.6% | 0.0081 |
| | | | |
| **Total** | 7628 | 100.0% | 0.3042 |

## Table 2. Hospitalization Rates by Gender and International Classification of Disease (ICD) Categories for Cohort of U.S. Navy Personnel

| | Males | | | Females | | |
|---|---|---|---|---|---|---|
| **International Classification of Disease (ICD) Category** | **No. of Hosp.** | **Percent of Hosp.** | **Hosp. Rate per 1000 strength per day** | **No. of Hosp.** | **Percent of Hosp.** | **Hosp. Rate per 1000 strength per day** |
| | | | | | | |
| Infectious/Parasitic | 270 | 6.2% | 0.0136 | 85 | 2.6% | 0.0165 |
| Neoplasm | 66 | 1.5% | 0.0033 | 72 | 2.2% | 0.0139 |
| Endocrine | 31 | 0.7% | 0.0016 | 39 | 1.2% | 0.0076 |
| Diseases of the Blood | 27 | 0.6% | 0.0014 | 13 | 0.4% | 0.0025 |
| Mental Disorders | 1234 | 28.3% | 0.0620 | 396 | 12.1% | 0.0767 |
| Nervous System | 116 | 2.7% | 0.0058 | 57 | 1.7% | 0.0110 |
| Circulatory | 58 | 1.3% | 0.0029 | 15 | 0.5% | 0.0029 |
| Respiratory | 341 | 7.8% | 0.0171 | 164 | 5.0% | 0.0318 |
| Digestive | 471 | 10.8% | 0.0237 | 180 | 5.5% | 0.0349 |
| Genitourinary | 136 | 3.1% | 0.0068 | 270 | 8.3% | 0.0523 |
| Preg., Childbirth, Puerperium | 0 | 0.0% | - | 1383 | 42.4% | 0.2679 |
| Skin/Subcutaneous | 216 | 4.9% | 0.0108 | 36 | 1.1% | 0.0070 |
| Musculoskeletal | 509 | 11.7% | 0.0256 | 218 | 6.7% | 0.0422 |
| Congenital | 36 | 0.8% | 0.0018 | 28 | 0.9% | 0.0054 |
| Symptoms/ill-defined conditions | 182 | 4.2% | 0.0091 | 94 | 2.9% | 0.0182 |
| Injury, poisoning | 555 | 12.7% | 0.0279 | 128 | 3.9% | 0.0248 |
| Supplementary | 119 | 2.7% | 0.0060 | 83 | 2.5% | 0.0161 |
| | | | | | | |
| **Total** | 4367 | 100.0% | 0.2193 | 3261 | 100.0% | 0.6317 |

**Table 3. Number and Percent of Primary and Secondary Diagnoses by International Classification of Disease (ICD) Categories for U.S. Navy Cohort**

| International Classification of Disease (ICD) Category | Number of Primary Diagnoses | Percent of Primary Diagnoses | | Number of Secondary Diagnoses | Percent of Secondary Diagnoses |
|---|---|---|---|---|---|
| | | | | | |
| Infectious/Parasitic | 355 | 4.7% | | 318 | 4.0% |
| Neoplasm | 138 | 1.8% | | 90 | 1.1% |
| Endocrine | 70 | 0.9% | | 211 | 2.6% |
| Diseases of the Blood | 40 | 0.5% | | 160 | 2.0% |
| Mental Disorders | 1630 | 21.4% | | 1594 | 19.9% |
| Nervous System | 173 | 2.3% | | 154 | 1.9% |
| Circulatory | 73 | 1.0% | | 101 | 1.3% |
| Respiratory | 505 | 6.6% | | 360 | 4.5% |
| Digestive | 651 | 8.5% | | 312 | 3.9% |
| Genitourinary | 406 | 5.3% | | 318 | 4.0% |
| Preg., Childbirth, Puerperium | 1383 | 18.1% | | 1246 | 15.5% |
| Skin/Subcutaneous | 252 | 3.3% | | 139 | 1.7% |
| Musculoskeletal | 727 | 9.5% | | 402 | 5.0% |
| Congenital | 64 | 0.8% | | 38 | 0.5% |
| Symptoms/ill-defined conditions | 276 | 3.6% | | 287 | 3.6% |
| Injury, poisoning | 683 | 9.0% | | 678 | 8.5% |
| Supplementary | 202 | 2.6% | | 1608 | 20.1% |
| | | | | | |
| **Total** | 7628 | 100.0% | | 8016 | 100.0% |

## Table 4. Fifteen Most Prevalent International Classification of Disease (ICD) Diagnoses Among Hospitalized Members of Navy Cohort

| ICD Code | ICD Description | No. of hospitalizations | Percent of hospitalizations |
|---|---|---|---|
| | | | |
| 309 | Adjustment reaction | 533 | 6.99% |
| 303 | Alcohol dependence syndrome | 369 | 4.84% |
| 301 | Personality disorders | 320 | 4.20% |
| 664 | Perineum and vulva trauma during delivery | 243 | 3.19% |
| 717 | Internal derangement of knee | 176 | 2.31% |
| 52 | Chickenpox | 176 | 2.31% |
| 474 | Chronic disease of tonsils and adenoids | 142 | 1.86% |
| 682 | Other cellulitis and abscess | 129 | 1.69% |
| 656 | Other fetal and placental problems | 124 | 1.63% |
| 780 | General symptoms | 124 | 1.63% |
| 644 | Early or threatened labor | 123 | 1.61% |
| 305 | Nondependent abuse of drugs | 118 | 1.55% |
| 550 | Inguinal hernia | 116 | 1.52% |
| 718 | Other derangement of joint | 112 | 1.47% |
| 727 | Other disorders of synovium, tendon and bursa | 110 | 1.44% |
| | | | |
| **Total** | | 2915 | 38.21%* |

*Total number of hospitalizations among Navy cohort = 7,628

## Table 5. Fifteen Most Prevalent International Classification of Disease (ICD) Diagnoses Among Male Members of Navy Cohort

| ICD Code | ICD Description | No. of hospitalizations | Percent of hospitalizations |
|---|---|---|---|
| | | | |
| 309 | Adjustment reaction | 385 | 8.82% |
| 303 | Alcohol dependence syndrome | 303 | 6.94% |
| 301 | Personality disorders | 232 | 5.31% |
| 52 | Chickenpox | 156 | 3.57% |
| 717 | Internal derangement of knee | 140 | 3.21% |
| 682 | Other cellulitis and abscess | 117 | 2.68% |
| 550 | Inguinal hernia | 110 | 2.52% |
| 305 | Nondependent abuse of drugs | 104 | 2.38% |
| 780 | General symptoms | 94 | 2.15% |
| 718 | Other derangement of joint | 81 | 1.85% |
| 540 | Acute appendicitis | 77 | 1.76% |
| 474 | Chronic disease of tonsils and adenoids | 70 | 1.60% |
| 520 | Disorders of tooth development and disruption | 69 | 1.58% |
| 296 | Affective psychoses | 64 | 1.47% |
| 727 | Other disorders of synovium, tendon and bursa | 59 | 1.35% |
| | | | |
| **Total** | | 2061 | 47.19%* |

*Total number of hospitalizations among male personnel = 4,367

## Table 6. Fifteen Most Prevalent International Classification of Disease (ICD) Diagnoses Among Female Members of Navy Cohort

| ICD Code | ICD Description | No. of hospitalizations | Percent of hospitalizations |
|---|---|---|---|
| | | | |
| 664 | Perineum and vulva trauma during delivery | 243 | 7.45% |
| 309 | Adjustment reaction | 148 | 4.54% |
| 656 | Other fetal and placental problems | 124 | 3.80% |
| 644 | Early or threatened labor | 123 | 3.77% |
| 650 | Normal delivery | 108 | 3.31% |
| 661 | Abnormality of forces of labor | 106 | 3.25% |
| 301 | Personality disorders | 88 | 2.70% |
| 474 | Chronic disease of tonsils and adenoids | 72 | 2.21% |
| 303 | Alcohol dependence syndrome | 66 | 2.02% |
| 634 | Spontaneous abortion | 66 | 2.02% |
| 642 | Hypertension complicating pregnancy, the puerperium | 57 | 1.75% |
| 663 | Umbilical cord complications | 54 | 1.66% |
| 648 | Conditions complicating pregnancy, the puerperium | 52 | 1.59% |
| 727 | Other disorders of synovium, tendon and bursa | 51 | 1.56% |
| 658 | Other problems amniotic cavity and membrane | 47 | 1.44% |
| | | | |
| **Total** | | 1405 | 43.08%* |

*Total number of hospitalizations among female personnel = 3,261

## Table 7. Mean Lengths of Hospital Stay and Percent Distribution of Stays by ICD Disease Categories for U.S. Navy Cohort

| International Classification of Disease (ICD) Category | Average Length of Hosp. Stay | Stay of 0.5 - 3 days | Stay of 4 - 7 days | Stay of 8 - 14 days | Stay of 15 - 30 days | Stay of 31+ days |
|---|---|---|---|---|---|---|
| | | | | | | |
| Infectious/Parasitic | 4.68 | 35.5% | 53.0% | 10.7% | 0.6% | 0.3% |
| Neoplasm | 3.49 | 71.7% | 15.9% | 7.2% | 5.1% | 0.0% |
| Endocrine | 3.34 | 64.3% | 27.1% | 5.7% | 2.9% | 0.0% |
| Diseases of the Blood | 4.68 | 57.5% | 32.5% | 7.5% | 0.0% | 2.5% |
| Mental Disorders | 13.89 | 35.2% | 21.6% | 12.6% | 12.5% | 18.2% |
| Nervous System | 4.17 | 74.0% | 14.5% | 6.4% | 2.9% | 2.3% |
| Circulatory | 3.32 | 76.7% | 15.1% | 5.5% | 1.4% | 1.4% |
| Respiratory | 2.48 | 76.0% | 19.8% | 3.2% | 0.8% | 0.2% |
| Digestive | 2.64 | 79.1% | 14.6% | 4.9% | 1.2% | 0.2% |
| Genitourinary | 2.32 | 77.6% | 17.5% | 4.2% | 0.7% | 0.0% |
| Preg., Childbirth, Puerperium | 2.61 | 83.6% | 13.9% | 1.7% | 0.7% | 0.1% |
| Skin/Subcutaneous | 3.30 | 59.1% | 34.9% | 5.6% | 0.4% | 0.0% |
| Musculoskeletal | 1.96 | 87.3% | 8.3% | 3.4% | 0.6% | 0.4% |
| Congenital | 3.59 | 82.8% | 9.4% | 6.3% | 0.0% | 1.6% |
| Symptoms/ill-defined conditions | 3.22 | 69.9% | 22.1% | 6.5% | 1.1% | 0.4% |
| Injury, poisoning | 4.45 | 67.3% | 20.4% | 5.9% | 4.8% | 1.6% |
| Supplementary | 2.39 | 85.1% | 8.9% | 4.0% | 1.0% | 1.0% |
| | | | | | | |
| **Total** | 5.32 | 66.6% | 19.1% | 6.2% | 3.8% | 4.3% |

## Table 8. Medical Ineffective Rates for CONUS-based Cohort of Navy Personnel by ICD Disease Category

| International Classification of Disease (ICD) Category | Hosp. Rate (daily per 1000 strength) | Avg. Length of Hospital Stay (days) | Ineffective Rate (daily per 1000 strength) |
|---|---|---|---|
| | | | |
| Infectious/Parasitic | 0.014 | 4.68 | 0.066 |
| Neoplasm | 0.006 | 3.49 | 0.019 |
| Endocrine | 0.003 | 3.34 | 0.009 |
| Diseases of the Blood | 0.002 | 4.68 | 0.007 |
| Mental Disorders | 0.065 | 13.89 | 0.903 |
| Nervous System | 0.007 | 4.17 | 0.029 |
| Circulatory | 0.003 | 3.32 | 0.010 |
| Respiratory | 0.020 | 2.48 | 0.050 |
| Digestive | 0.026 | 2.64 | 0.069 |
| Genitourinary | 0.016 | 2.32 | 0.038 |
| Preg., Childbirth, Puerperium | 0.055 | 2.61 | 0.144 |
| Skin/Subcutaneous | 0.010 | 3.30 | 0.033 |
| Musculoskeletal | 0.029 | 1.96 | 0.057 |
| Congenital | 0.003 | 3.59 | 0.009 |
| Symptoms/ill-defined conditions | 0.011 | 3.22 | 0.035 |
| Injury, poisoning | 0.027 | 4.45 | 0.121 |
| Supplementary | 0.008 | 2.39 | 0.019 |
| | | | |
| **Total** | 0.304 | 5.32 | 1.619 |

## Table 9. Medical Ineffective Rates for Male CONUS-based Navy Personnel by ICD Disease Category

| International Classification of Disease (ICD) Category | Hosp. Rate (daily per 1000 strength) | Avg. Length of Hospital Stay (days) | Ineffective Rate (daily per 1000 strength) |
|---|---|---|---|
| | | | |
| Infectious/Parasitic | 0.014 | 4.94 | 0.067 |
| Neoplasm | 0.003 | 5.43 | 0.018 |
| Endocrine | 0.002 | 4.73 | 0.007 |
| Diseases of the Blood | 0.001 | 4.04 | 0.005 |
| Mental Disorders | 0.062 | 14.44 | 0.895 |
| Nervous System | 0.006 | 4.64 | 0.027 |
| Circulatory | 0.003 | 3.02 | 0.009 |
| Respiratory | 0.017 | 2.78 | 0.048 |
| Digestive | 0.024 | 2.79 | 0.066 |
| Genitourinary | 0.007 | 2.72 | 0.019 |
| Preg., Childbirth, Puerperium | ---- | ---- | ---- |
| Skin/Subcutaneous | 0.011 | 3.28 | 0.036 |
| Musculoskeletal | 0.026 | 2.05 | 0.052 |
| Congenital | 0.002 | 5.35 | 0.010 |
| Symptoms/ill-defined conditions | 0.009 | 3.67 | 0.034 |
| Injury, poisoning | 0.028 | 4.20 | 0.117 |
| Supplementary | 0.006 | 2.54 | 0.015 |
| | | | |
| **Total** | 0.219 | 6.50 | 1.425 |

## Table 10. Medical Ineffective Rates for Female CONUS-based Navy Personnel by ICD Disease Category

| International Classification of Disease (ICD) Category | Hosp. Rate (daily per 1000 strength) | Avg. Length of Hospital Stay (days) | Ineffective Rate (daily per 1000 strength) |
|---|---|---|---|
| | | | |
| Infectious/Parasitic | 0.016 | 3.86 | 0.064 |
| Neoplasm | 0.014 | 1.72 | 0.024 |
| Endocrine | 0.008 | 2.23 | 0.017 |
| Diseases of the Blood | 0.003 | 6.00 | 0.015 |
| Mental Disorders | 0.077 | 12.60 | 0.967 |
| Nervous System | 0.011 | 3.22 | 0.036 |
| Circulatory | 0.003 | 4.47 | 0.013 |
| Respiratory | 0.032 | 1.87 | 0.059 |
| Digestive | 0.035 | 2.26 | 0.079 |
| Genitourinary | 0.052 | 2.11 | 0.111 |
| Preg., Childbirth, Puerperium | 0.268 | 2.61 | 0.698 |
| Skin/Subcutaneous | 0.007 | 3.42 | 0.024 |
| Musculoskeletal | 0.042 | 1.76 | 0.074 |
| Congenital | 0.005 | 1.32 | 0.007 |
| Symptoms/ill-defined conditions | 0.018 | 2.34 | 0.043 |
| Injury, poisoning | 0.025 | 5.54 | 0.137 |
| Supplementary | 0.016 | 2.17 | 0.035 |
| | | | |
| **Total** | 0.632 | 3.80 | 2.400 |

# REPORT DOCUMENTATION PAGE



| 1. Report Date (DD MM YY) | 2. Report Type | 3. DATES COVERED (from - to) |
|---|---|---|
| Sep 01 | Final | Apr 91 – Dec 92 |

**4. TITLE AND SUBTITLE**
Hospital Admission Rates and Lengths of Treatment among a CONUS-based Cohort of Navy Personnel

**5a. Contract Number:**
**5b. Grant Number:**
**5c. Program Element: DARPA**
**5d. Project Number: Reimbursable**
**5e. Task Number:**
**5f. Work Unit Number: 60103**
**5g. IRB Protocol Number: NA**

**6. AUTHORS**
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**7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)**
Naval Health Research Center
P.O. Box 85122
San Diego, CA 92186-5122

**8. PERFORMING ORGANIZATION REPORT NUMBER**
Report No. 01-21

**8. SPONSORING/MONITORING AGENCY NAMES(S) AND ADDRESS(ES)**
Chief, Bureau of Medicine and Surgery
Code M2
2300 E St NW
Washington DC 20372-5300

**10. Sponsor/Monitor's Acronyms(s)**
BuMed

**11. Sponsor/Monitor's Report Number(s)**

**12 DISTRIBUTION/AVAILABILITY STATEMENT**
Approved for public release; distribution unlimited.

**13. SUPPLEMENTARY NOTES**

**14. ABSTRACT (maximum 200 words)**

Objective. This effort is to determine the number of individuals who may be unavailable on the eve of a hypothetical deployment due to disease and nonbattle injury (DNBI) hospital admissions.

Methods: a Cohort of Navy personnel enlisting after the Fulg War (April 1991- December 1992) was defined using service history files maintained by Naval Health Research Center (NHRC) in San Diego. The length of each service member's time in the Navy was determined from the service history files, and hospital admissions records for this cohort extracted from medical history files maintained by NHRC. Rates of DNBI incidence and mean lengths of treatment were computed for the overall cohort, and for men and women service members separately.

Results: The overall rate of hospitalization for the Navy cohort examined was 0.304 admissions per 1000 strength per day. The mean length of treatment was 5.32 days. Multiplying the admission rate times the mean length of treatment yields a 'medically infective' rate' of 1.62 individuals per 1000 strength per day. A substantial gender difference in hospitalization incidence did exist, due largely to female admissions for pregnancy-related conditions.

Conclusions: Determination of the levels of training and cross-training of personnel on advanced technologies critical to mission success should take into consideration that two people per 1000 strength may be medically ineffective on any given day.

**14. SUBJECT TERMS**
disease and nonbattle injury (DNBI); hospital admissions; hospitalizations; men and women service members

| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGE | 18a. NAME OF RESPONSIBLE PERSON |
|---|---|---|---|---|---|
| a. REPORT | b.ABSTRACT | C. THIS PAGE | | | Commanding Officer |
| UNCL | UNCL | UNCL | UNCL | 15 | 18b. TELEPHONE NUMBER (INCLUDING AREA CODE) COMM/DSN: (619) 553-8429 |